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ABSTRACT

This interim report describes the development of a networked computerized classroom language management and recording system to assist teachers of children who are deaf or hard-of-hearing. The system will provide storage and access capability for such information as changes in instruction, language learning progress, modifications in communication systems, and changes in the student's family and school circumstances. Thirteen clusters of variables have been identified for the database content (e.g., hearing loss, family background, speech, reading, instructional strategies). A hypercard format allows user-friendly procedures for input, updating, output, and information transfer. A network involving seven different programs with at least 12 classrooms and about 75 children has been initiated. Future project activities involve reviewing and modifying the database and operating procedures, operationalizing the network, and incorporating teacher training programs. The network is also seen to serve as a data collection system for research. The system's typical operation is described with sample screens. (DB)

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A Computerized Classroom Language Management And Recording System for Deaf and Hard of Hearing Children

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In order to make the workload of teachers of deaf and hearing impaired children more manageable and thus enable them to better meet community expectations, we believe that a networked computerized classroom language management and recording system should be developed to allow a teacher to better manage the large amount of information required for effective teaching. This is an interim report on the development of such a system.

The first major step in this design effort, a first determination of the data base content, has largely been completed during the course of a Mary Switzer Distinguished Research Fellowship by the first author. Thirteen different clusters of variables have so far been identified for classroom usage. These are (a) hearing loss, (b) additional disabilities, (c) family background, (d) language, (e) audition, (f) speech reading, (g) speech, (h) manual communication, (i) reading, (j) writing, (k) instructional strategies, (l) instructional environment, and (m) test scores. The clusters vary in complexity, and a few are still incomplete.

A Hypercard format for data base content use was also largely completed during the fellowship. User-friendly procedures have been developed for (a) input, (b) up-dating, (c) output, and (d) information transfer. Upon entry into the educational system, i.e., infant program, preschool, and/or kindergarten, a child can be described on the above noted variables by teachers and other service personnel (e.g., audiologists, psychologists, etc.). Thereafter, information input will primarily be that of noting changes in instruction, updating language learning progress and other changes in family and school circumstances as they occur. Teachers will note all local modifications in communication systems. All information will be dated automatically and organized so that teacher and school can quickly and accurately assess the progress of individual students and classes. Every effort has been made to format the Hypercard information in clear graphic and tabular ways that are and will continue to be judged useful and easy to use by teachers.

The next step, the agreement to form a network of varied classes and children, is also complete. San Francisco State University (SFSU) will form a network with seven different programs in California (at least 12 classrooms with about 75 children) representing TC, Oral/Aural, Cued Speech, and ASL communication modes. The children will be observed from their entry into the educational system, i.e., infant programs, preschool, and kindergarten. Each classroom needs to be supplied with a personal computer, printer, and telephone modem. This would enable the

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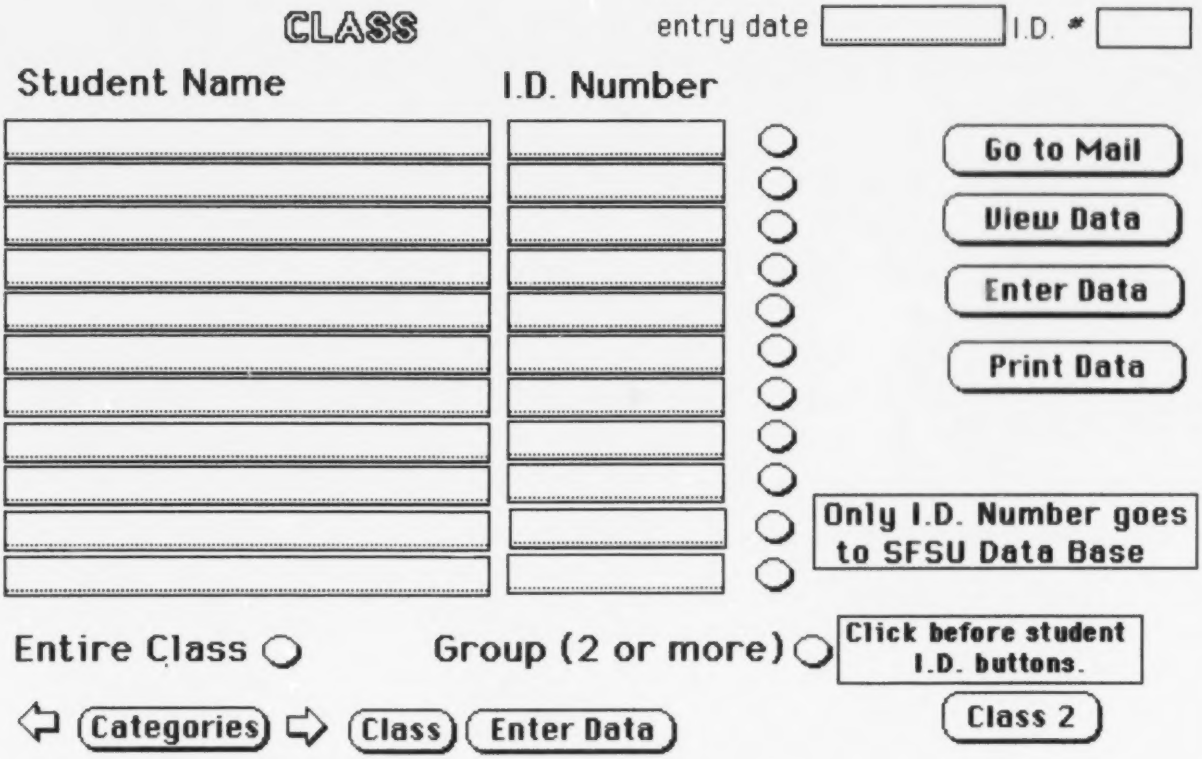
teacher to monitor more effectively student language learning as it occurs and simultaneously transfer data to the centralized University site for analysis and description.

The Hypercard front end is intended to interface with Oracle, a powerful mainframe-resident relational data base at SFSU. An application for financial support is pending. When obtained the next year of this project will be devoted to (a) reviewing and evaluating the data base content, format, and operating procedures, (b) programming Oracle to accommodate the Hypercard front end and SPSS analysis procedures, and (c) to getting the network into operation. The goal is to allow for maximum flexibility while providing an easy-to-use format for teachers and other service providers. Thereafter, the system will be incorporated into the SFSU teacher training program and in in-service programs for teachers in California during the second and third years of the project. Rigorous evaluations of the efficiency and utility of the system will be conducted during these years and revisions made as necessary.

This networked classroom management system is simultaneously a new data collection system. It can serve as a model for conducting research on a regional or national basis for a wide range of hypotheses. The electronic form and storage of the data collected for this project will enable it to be a valuable and cost effective resource for the Office of Education, other investigators, and student theses. Further, it is believed that the management and recording system, with some minor modifications, may also be useful in the education of children who have language problems for reasons other than deafness, e.g., non-speaking physically handicapped using augumentative communication devices, emotionally disturbed children, as well as some severely handicapped children.

Here now is a description of the system in operation. A teacher will enter the system by using his (her) computer and telephone modem to enter the California State University telephone system by dialing the nearest (local) University. This, in turn, provides direct access to the central computer at SFSU.

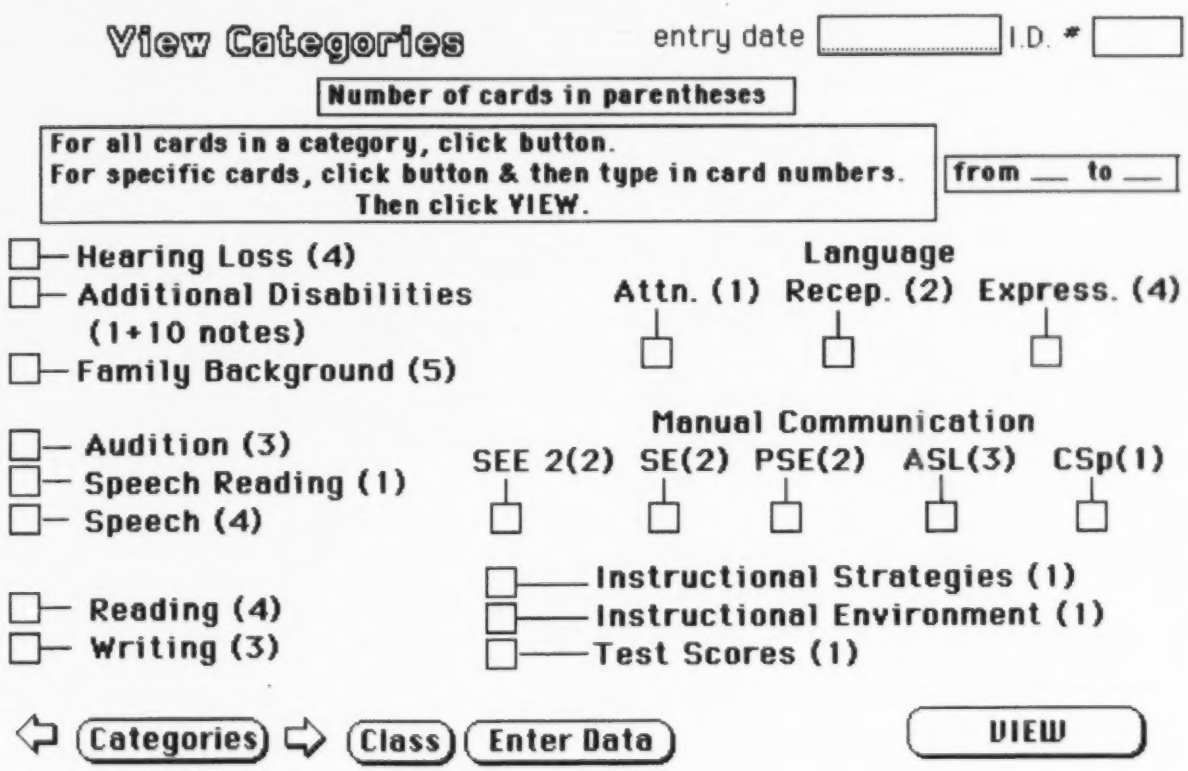
The Class card has been formatted so that the teacher needs to type in the name of the student only once. (The name of the student will not be forwarded to SFSU, only the ID. number). Thereafter, for whatever function he (she) wishes to use, the ID. button is all that needs to be clicked. After that the teacher then has four options: to (1) use the mail system, (2) enter data, (3) view data, and (4) print data. By merely clicking a mouse on the appropriate button, the teacher will be able to shift from option to option as well as within options as desired. Because of space limitations, only two of the 70 cards are shown.



(1) the mail system: The teacher can read or write mail to all members of the network. At this writing, we presume that the Service - Research Center at SFSU will be the prime recipient because it will be staffed by the system designers, experienced teacher trainers, and researchers whose primary responsibility will be to service participating teachers and other researhers.

(2) to enter data: Data entry procedures have also been designed to utilize the clicking procedure to the maximum extent possible. After clicking the student ID. button, the teacher clicks the data category that he or she wishes to enter. First entries and updated entries are handled in exactly the same way - clicked. All entries are automatically dated by the central computer, although only the date of the last entry is displayed on the card for the teacher. We estimate that we have been successful in formatting the vast majority of information in the data base in this way. However, we have also provided many opportunities for the teacher to note important information in an unformatted manner. For example, each possible additional disability, e.g., vision, has a "note card" which can be used to describe information that appears relevant to the teacher. As additional information is accumulated, we hope to be able to further format that information to continue to ease the input burden on the teacher.

(3) to view data: Data can be viewed (a) as originally entered (but highlighted for easier viewing), (b) transformed into standard scores and displayed numerically or graphically, and (c) as comparisons between two individual students, two groups of students, one student and a group, one student and the entire class of students. Again, a click is all that is required of the teacher. After the teacher chooses the form in which he or she wishes to view the data, the teacher then selects the specific subset of the data of interest through the view category card. The View Category card allows the teacher to select any category or part of a category for viewing. It also permits him or her to know how many data cards are presently in the system.



(4) to print data: If desired, viewed items noted above will also be printed with a click command. However, it is expected that the bulk of printed data will consist of I.E.P. reports, school reports, and letters to parents. The SFSU Service and Research Center, with the help of the cooperating programs, will develop "consensus report forms". These will be scanned into the system and placed into the computer and upon command will be available to be completed by the teacher. In those cases where consensus forms cannot be used by a teacher, the SFSU Service Center will, upon request, scan a custom document into the system for that teacher.

Additionally, the Rehabilitation Counselor Training Program at SFSU plans to develop and incorporate an interface with this system. This will enable the project directors to have a simple and direct way to see how personnel from one other service discipline can use this data base effectively. On the other side of the continent, the Psychology Department at Gallaudet University in Washington D.C. has also expressed interest in this project. It offers a Masters Program in School Psychology and a Doctoral Program in Clinical Psychology. The faculty in these programs will inform SFSU about the specific informational needs of these specialities so that these can be incorporated into the data base and then, in turn, the system will become a part of the techniques used in their pre-service programs. Subsequently, the methodology can be introduced to existing in-service programs as graduates take their places as professionals in the field.

The Users' judgments and assessments, i.e., the teachers and other service providers, will be central to the evaluation process. These, and suggestions for improvement, will be sought on an on-going basis throughout the course of the project as well as during the formal meetings of network teachers. Indeed, there are still other advantages to the proposed system that should be mentioned, i.e., it has the built-in capability to time and count the amount of use and the response time of the system. This capability will enable us to obtain routinely a very large amount of objective quantitative information on the use and functioning of the system.

A. The Data Base Content: The adequacy of the data included in the data base is of central importance. These aspects of the information contained will be measured: (1) completeness, (2) order or sequencing, (3) the adequacy of the open categories, and (4) and the effectiveness of the notes technique for obtaining unanticipated information. Both teachers and SFSU Service personnel will rate all four aspects and make suggestions on how to improve them. In addition, a use count will made of each item in the data base.

B. The Data Base Functions: The four functions (1) Mail, (2) Data Entry, (3) View Data, and (4) Print Data will be measured for frequency of use, amount of time in use, and quality of response.

C. Training (1) Pre-service: Work samples will be developed for students to carry out each of the four basic functions of the system. Each student will be scored on accuracy, completeness, and amount of time required for each function.
(2) In-service: Each meeting of network teacher participants will contain one or more training activities. After the close of such session, participants will rate pertinent features of the session.

D. Documentation. All data will be retained and made available to qualified researchers in the field of deafness.

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